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Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

(FOUO 13/82)

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INTERNATIONAL AFFAIRS

EUROPEAN SPACE AGENCY TO DEVELOP NEW SATELLITE

PM211515 London FINANCIAL TIMES in English 21 May 82 p 8

[Report by Michael Donne: "New Satellite for Europe"]

[Text] The European Space Agency, of which the UK is a partner, is about to embark on a major new spacecraft programme--an unmanned "remote sensing satellite"--which can study the earth's mineral and other resources and monitor their use.

The cost of the programme is expected to be at least 100M pounds covering both the first satellite, ERS-1 and, eventually, a series of further satellites. ERS-1 is expected to be ready for launching by 1987.

Much work on the programme still has to be done, including determining who the contractors to the programme will be. The countries participating will include the UK and Belgium, France, West Germany, Italy, Spain, Sweden, Switzerland, Norway and Canada, with Denmark and Holland also likely to join in.

The finance available so far will enable the definition phase to begin soon, in which the programme's scope will be settled. The final step--hardware development--will be taken at the end of next year.

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INTERNATIONAL AFFAIRS

COUNTRIES MEET TO ORGANIZE SATELLITE ORGANIZATION

Paris AIR ET COSMOS in French 15 May 82 p 78

[Article by Pierre Langereux: "26 Countries Preparing Final Agreement on European Satellite Telecommunications Organization EUTELSAT to Exploit ECS Satellites"]

[Text] An intergovernmental meeting attended by 26 member countries of the CEPT [European Posts and Telecommunications Conference], 20 of which countries are already members of the Temporary EUTELSAT [European Satellite Telecommunications Organization](1), was held in Paris from 3 to 14 May to finalize and prepare for signature the agreements relative to the definitive structure of EUTELSAT, which will exploit the ECS [expansion unknown] satellites.

The Temporary Eutelsat was created 5 years ago at the initiative of the CEPT's Satellite Telecommunications Coordination Committee. The agreement putting in place the temporary organization was readied for signature on 13 May 1977; it went into effect on 30 June 1977 over the signatures of 17 members of the CEPT, including France. The organization, which has had its headquarters in Paris since then, was initially to have under it the ECS satellites for public telecommunications services and the MAROTS [expansion unknown], also known as the MARECS, satellites for maritime telecommunications services, all to be built--as well as the OTS satellite, which was also provided for in the agreement--by the ESA [European Space Agency]. But the subsequent creation of INMARSAT [International Maritime Satellite Telecommunications Organization] (see AIR ET COSMOS, No 886) relieved the Temporary Eutelsat of exploitation of the MARECS satellites. The first MARECS satellite (MARECS 1) was launched on 19 December 1981 and was put into operational service on 1 May 1982 (see AIR ET COSMOS, No 906). It will be operated by INMARSAT, as will be also the second MARECS satellite (MARECS 2).

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(1) As of 22 January 1982, the Temporary EUTELSAT had 20 member countries, all sharing the ECS satellite operating expenses. Half the financing was provided by four countries--France (16.4 percent), United Kingdom (16.4 percent), Italy (11.48 percent) and Germany (10.82 percent)--and the rest by the other participants: Austria, Belgium, Cyprus, Denmark, Spain, Finland, Greece, Ireland, Luxembourg, Norway, Netherlands, Portugal, Sweden, Switzerland, Turkey and Yugoslavia.

The Temporary EUTELSAT and the future definitive one, however, remain responsible for the operation of the ECS satellites, in accordance with the special agreement that was finalized for signature on 10 March 1978 and went into effect on 14 September 1978. The agreement provides for the putting in place of a European space telecommunications network--the ECS--to make available 10,000 telephone circuits linking the international switching centers of the CEPT member countries, and two color television channels to serve the member organizations of the EBU [European Broadcast Union]. An agreement signed 15 May 1979 between the Temporary EUTELSAT organization and the ESA provides that the ESA will supply, launch and maintain in orbit ECS satellites built with ESA credits. The total capacity of the ECS satellites is thus to be made available to EUTELSAT in exchange for fixed annual lump sum payments by EUTELSAT to ESA. These payments, however, will not fully cover the developmental and construction costs of the satellites.

Initially, the agreement provided for the launching of the first satellite in 1982 and the second one a year later. But owing to changes in the launching timetable of the Ariane rockets (owing in turn to MARECS 2 delays), ECS 1 cannot be launched until January 1983 and the second ECS satellite until the end of 1983 or beginning of 1984. This will probably delay the putting into service of the ECS network, which was originally scheduled during 1983. In all, five ECS satellites have been ordered, based on providing a permanent service during an initial period of 10 years. Recently, the Temporary EUTELSAT has decided to modify these satellites, except for the first one, to include additional circuits designed for "multiservices" (high-speed digital transmission). This capacity will be extended via circuits to be leased by EUTELSAT from the French PTT in the TELECOM 1 domestic satellites, to constitute an integrated "multiservices" network operated by EUTELSAT.

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NEWEST ANTENNAS FOR RECEIVING DIRECT SATELLITE BROADCASTS SHOWN

Paris AIR ET COSMOS in French 17 Apr 82 pp 39,48

[Article by Pierre Langereux: "New Antennas for Reception of Direct Satellite TV"]

[Text] The era of direct television via satellite has arrived. At the Components Show this year, six manufacturers were exhibiting their equipment--antennas with frequency converters (from 12 GHz to 0.9-1.7 GHz), and video-sound demodulators--for the reception of direct TV from the future satellites scheduled to be launched in 1985 by France and Germany, and in 1986 by Great Britain and Sweden.

These six manufacturers consisted of three French, two German, and, of course, one Japanese.

DIELA [Management of Electronics and Data Processing Industries], a French GIE [Economic Interest Group] formed by Thomson-Brandt and Tonna Electronique, showed a line of three antennas 0.7 m, 0.9 m and 1.5 m in diameter for individual or community reception. DIELA expects to mass produce 10,000 units per month of the 0.7-m and 0.9-m versions. The electronics will be built by Thomson-Brandt at Angers and the marketing will be done by Tonna, which specializes in antennas.

Portenseigne, a subsidiary of the Dutch Philips group, showed an antenna for TV reception from the OTS 2 experimental satellite and a prototype of a 1-m diameter antenna for individual reception of direct TV. However, the firm will also offer community antennas.

Visiodis, a subsidiary of Cables de Lyon and hence of the French CGE [General Electrical Company] group, showed its line of demodulators in conjunction with a 0.9-m antenna built by the German maker Hirschmann and an SHF [superhigh frequency] array by the Japanese firm CDNK [expansion unknown]! Under agreements signed with the German firm, Visiodis will thus offer a line of individual as well as community receiving equipment using 0.9-m, 1.4-m, 2.5-m and 3- or 4-m antennas.

WISI [expansion unknown]-France, a subsidiary of the German WISI group, showed for the first time in France (after Berlin last summer) a 0.6-m receiving antenna

installation enabling reception of up to 15 TV channels. Dubbed the "Orbit," this installation is designed for small-scale (one to three households) community reception.

FUBA [expansion unknown]-France, a subsidiary of the German FUBA group, exhibited a 0.9-m antenna associated with a demodulator for the reception of the 5 channels of 8 European satellites (right-to-left circular polarization). The firm had previously exhibited at the Montreux Show (Switzerland) a 1.8-m antenna for community reception.

DX Antenna Company, a Japanese firm represented in France, showed a complete line of converters, demodulators and 0.75-m, 0.9-m and 1.2-m antennas for individual and community reception. This equipment was already practically at the "take home" stage, its mass production being already under way on a small scale in Japan. But for the time being, this equipment is being based solely on the PAL [Phase Automation Line?] standard. We note that DX also builds 4-GHz antennas for reception from Soviet (Gorizont) satellites.

This rapid survey made on the occasion of the 1982 Components Show indicates that most manufacturers are offering a line of equipment (for individual or community reception) using quite similar technologies: Multichannel demodulators and light-weight parabolic antennas based on aluminum (plasticated or not) reflectors in all cases, since the manufacturers consider that plastic parabolas are still too costly. All the makers also estimate it will take them 1 and 1/2 years to get into mass production. Some, like Portenseigne, complain of the lack of a French standard with respect to direct TV receiving equipment (analog or digital sound). A single European standard, however, (including France) should, in principle, be announced in September.

Prices for this equipment vary widely. Some (WISI, Visiodis) are not quoting any prices. Others (FUBA, DIELA) are quoting a price of around 3,000 francs for their individual reception equipment (with a small-diameter, around 0.9-m antenna), which is about the "official" price that has been quoted for a little over 1 year by TDF [TELEDIFFUSION-FRANCE]. Portenseigne, however, quotes a price of 3,000 francs "per program" for a community reception equipment (with 1.8-m antenna), which would thus come to around 10,000-12,000 francs. On the other hand, Japan's DX is currently quoting a price of 25,000 francs for a complete community reception equipment (1.2-m antenna) and expects to lower the price of this same equipment to 8,000-10,000 francs per unit for a production run of 10,000 units to be launched by the end of 1983. As for the price of individual reception equipment, DX estimates it will be very much higher than the one being quoted by TDF!

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VARIOUS SCIENTIFIC MISSIONS ENVISIONED FOR SIGMA SATELLITE

Paris AIR ET COSMOS in French 17 Apr 82 p 40

[Article by Pierre Langereux: "Mid-1982 Decision Due on French 'SIGMA' Satellite Project"]

[Text] The CNES's [National Center for Space Studies] space center at Toulouse is currently conducting a definition study for the new French "SIGMA [Ariane-Mounted Gamma Imagery Satellite] which could be launched toward the end of 1985 to coincide with the first demonstration flight of the new European rocket Ariane 4.

The detailed study of the SIGMA project is to be ready by June-July 1982, when a decision must be taken concerning the building of the SIGMA satellite, which is "competing" with another equally interesting French project--that of the oceanic altimetry satellite "Poseidon."

Assuming a favorable decision, the SIGMA project could be actualized following a very brief developmental period (by the beginning of 1983). Integration of the satellite could then be completed during the first half of 1985 for delivery at the Kourou launching complex (French Guyana) during the third quarter of 1985. It could then be launched in October or December 1985. The satellite would have a nominal life of 1 and 1/2 to 2 years, permitting observation of some 270 sources.

The SIGMA project, which was proposed by the scientists of the French AEC [Atomic Energy Commission] of Saclay and of the CESR [Center for the Study of Radiation in Space] of Toulouse during the scientific seminar at Arcs (September 1981), concerns the high-resolution and very-high-sensitivity mapping of outer-space sources of gamma rays within the energy band between 20 and 2,000 keV [kilo electron volt]. The recent successes obtained in the astronomy of high-energy electromagnetic radiations, mainly by way of satellites (United States, USSR and France), have in fact shown that violent processes are commonplace in most of the phenomena that determine the dynamic and the evolution of the stars, the galaxies and the universe as a whole. The study of these phenomena cannot however be truly effective unless the locations of these processes can be identified without ambiguity, so as to also be able to study them at other wavelengths. Hence the importance

of the SIGMA mission, the aim of which is to improve by a factor of 10 to 100 (a few minutes of arc versus a few degrees) the angular resolution obtainable until now in gamma imagery, with a sensitivity of the order of several millicrabs (1 millicrab at 200 keV = 6×10^{-7} photons / cm^2/sec/keV).

The SIGMA satellite's observation instrument will be a coded-mask telescope having as a detector a scintillation camera derived from a camera used in nuclear medicine. The camera's coded mask will consist of a mosaic of bits of tungsten arranged in a basic pattern (blacks and whites coded randomly in the two dimensions) which is reproduced cyclically to form the overall mosaic. The parallel flux of photons emanating from a given gamma source will thus project the "shadow" of the mask on to the scintillator within a very precise area (detectors) where this pseudoimage will be recorded (after extraction of parasitic "background noise"). An appropriate mathematical treatment of these pseudoimages will subsequently enable the reconstruction of the direction of arrival of the high-energy photons and (knowing the position of the satellite) the location of the source of the radiation.

The CNES has proposed that this SIGMA satellite instrument be built through a multilateral, especially European, cooperation. Talks are already under way with Italy, who is also including a high-energy astronomy mission (X-ray astronomy) in her new space plan (see AIR ET COSMOS, No 901). The SIGMA satellite, however, would be built by the Toulouse space center under the direction of the CNES, and its platform by a French firm (MATRA [Mechanics, Aviation and Traction Company] or AEROSPATIALE [National Industrial Aerospace Company]).

The SIGMA mission would also accommodate, as secondary satellite "passengers," scientific experiments that could be carried out within the constraints imposed by the primary experiment, such as, for example, experiment "Sursaut" (spectrometry of gamma bursts from 2 keV to 2 MeV) and experiment "CUBE" (diffused ultraviolet spectrometry, in the remote ultraviolet range of 900-2,000 Angstroms, of outermost space).

The satellite could also serve as a technological test bench, using--functionally or experimentally--new equipment being developed for future missions: a magnetic bubble memory for the recording of data aboard the satellite, a nickel-hydrogen battery for the storage of energy during eclipses, etc.

The SIGMA satellite would weigh around 2 tons, of which 900 kg would be payload consisting of the main telescope, the other scientific instruments and the technological equipment. The platform, weighing around 600 kg (stripped), would accommodate the 500 kg of propellants needed for the satellite's attitude and orbit control throughout the mission. It would use a very elaborate heat control system (flaps and heat pipes), considering the very long duration of eclipses (several hours per orbit during certain periods).

Based on its mission and on the initial orbit imposed by the launcher (geostationary transfer orbit), the SIGMA satellite could be placed in a circumterrestrial elliptic orbit. Two orbits are being studied: One 13,000-200,000 km (nominal), and the other 3,000-150,000 km (minimal).

Exploration of radiation sources could be carried out by means of a heliocentric pointing procedure (enabling the use of fixed solar panels). This would yield, over a 24-hour exposure, a stability of 1 minute of arc per 4 hours and an absolute pointing precision of 0.5 degrees. The data stored in a 100 Mbits/sec memory would be retransmitted by way of an omnidirectional antenna to earth stations at the rate of 4 Kbits/sec (visibility 8 hrs/day). The satellite would be controlled from the CNES's Toulouse space center.

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FRANCE

PTT MINISTER CRITICIZES INTELSAT'S USE OF EXTRA CIRCUITS

Paris AIR ET COSMOS in French 24 Apr 82 p 53

[Article by Pierre Langereux: "Criticism of Intelsat by French PTT Minister"]

[Excerpts] The 12th session of the meeting of signatory countries to Intelsat, held for the first time in Paris from 19 to 22 April, was opened by the French minister of PTT, Mr Louis Mexandeau, who recalled France's role in the international space telecommunications organization.

The minister of PTT pointed out that France has always been convinced of the advantage to Intelsat of putting the procurement of equipment and services on as broad an international competitive basis as possible to obtain the best available quality and price. Mr Mexandeau expressed what he feels can only be the Intelsat organization's satisfaction with the international cooperation that characterized the building of Intelsat satellites 4 and 5, as it will also be with the choice of the Ariane launcher for the orbiting of Intelsat satellites 5 and 5A. The first launching of an Intelsat 5 satellite by Ariane has however been delayed by delays in the delivery of the satellites.

The French minister of PTT, on the other hand, stated that he is not entirely in agreement with certain orientations adopted by Intelsat. While fully appreciating "the priceless contribution being made by Intelsat to the development and creation of space telecommunications networks in the disadvantaged countries," through the utilization of extra circuits in the international satellites, the French minister of PTT is "not fully convinced that Intelsat should invest specifically in this sector of activity." According to Mr Mexandeau, two reefs must be avoided by Intelsat: Investment in general-purpose satellites too close to those designed for international service, and in too highly specialized satellites. The first are rarely optimized to serve the needs of a country, and the second can only respond very limitedly to a narrowly specified need. The French minister deems it to not Intelsat's province to satisfy this or that individual need; the solution to national needs must rather be sought within other national or regional institutional frameworks, without prejudice, however, to the interests of Intelsat!

Similarly, as regards new services or services to businesses, the French minister holds that "Intelsat should not have direct contact with customers for these services, since this is not its role." These contacts, Mr Mexandeau says, are the exclusive responsibility of national administrations.

French experiments with Telecom 1 and the European one with Eutelsat demonstrate clearly that a certain number of needs cannot be met efficiently other than at national or regional levels. As an example, there is the interconnection with terrestrial networks or the choice of frequency bands (variable according to location). Intelsat can obviously provide a useful contribution to its members in the form of interconnections among such networks; for example, between the Americas and Europe. But here again, Mr Mexandeau is not convinced that Intelsat should invest too heavily in specialized services; in his view, "The organization should rather seek to maximize its profit on the vast gamut of services it already offers."

Intelsat must devote itself primarily to meeting the challenge of the next decade, the French minister declared. The constant high growth rate of international telephone and television traffic (+20 to 25 percent per annum) is going to confront Intelsat with the saturation of its new Intelsat 6 satellites by 1993 or 1994, that is, even before they will have reached the end of their useful life (10 years from 1986). Intelsat must therefore find technical and operational solutions to meet this growth in demand, optimizing its use of frequency bands and geostationary orbit, which are limited natural resources. And if Intelsat can succeed in satisfying the demand, its revenues are assured and Mr Mexandeau will have no misgivings as to Intelsat's future financial soundness.

The French minister, however, emphasized the fact that, for the first time in over 10 years, the tariffed rate for use of the Intelsat space segment will not be lowered this year and will remain at its 1981 level (around $4,680). Without attaching undue importance to this development, Mr Mexandeau "nevertheless sees in it a symbolic significance: Actually, it is an indication that growth of its investments is outpacing the growth in Intelsat traffic," and the French minister points out that "The international organization cannot properly ignore the fact that such a trend must not be allowed to continue for too long."

This situation stems in fact from the very high cost of the program for new Intelsat 6 satellites ordered from Hughes Aircraft (United States), in the amount of $700 million covering the construction of the first five satellites, an amount that could actually attain $1.6 billion with the 11 other satellites covered by option. In this regard, Mr Santiago Astrain, director general of Intelsat, stated to us that the first two Intelsat 6 satellites are scheduled to be launched by the Shuttle (with IUS [interim upper stage]) and that the three subsequent ones will be placed in orbit by the future European Ariane 4 launcher. These launchings have not yet been negotiated, however, with the appropriate authorities. They will be negotiated within 1 year. Mr Astrain,

on the other hand, expressed serious concern regarding the very tight timetable involved in the putting into service of the Ariane 4 launcher, the first flight of which is scheduled for the end of 1985, at the same time as the delivery of the first Intelsat 6 satellite.

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BRIEFS

FIBER OPTICS GUIDELINES--Since the creation in 1977 by the CEI [International Electrical Engineering Committee] of Study Subcommittee SC46E on Fiber Optics, which is headed by Mr Treheux of the CNET [National Center for Telecommunications Studies], many international experts have been working to establish international guidelines on optical fibers and their connecting components. In 1978, the UTE [Technical Union on Electricity], the French counterpart of the CEI, decided to form the UTE/CEF [expansion unknown] Group 46E to work closely with the CEI, and Committee 93/8 to draw up French guidelines. These two groups are headed by Mr Chiron, manager of the Thomson-CSF [General Radio Company], and bring together all the professional organizations concerned. Their work has been performed diligently and has resulted in the bringing forth of some guidelines. The first of these--UTE Standard PR 93810: General Specification for Connectors for Optical Fibers and Cables--has just been published and is available at the UTE sales office: Service de Vente UTE; 12, Place des Etats-Unis, 75783 Paris Cedex 16; telephone (1) 723-72-57. A second standard--UTE Standard PR 93850: General Specification for Optical Fibers and Cables--will appear shortly. These two sets of guidelines provide, in particular, the definitions and methods of measurements to be used to ensure quality control of manufactured products. These guidelines will be supplemented later by detailed specifications applying to individually defined products: Optical fibers for telecommunications use, optical cables for aeronautics use, one-way connectors, etc. [Text] [Paris AIR ET COSMOS in French 15 May 82 p 78] [COPYRIGHT: A. & C. 1982] 9238

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